The Oklahoma State University (OSU) Center for Veterinary Health Sciences (CVHS) this year received a grant of almost $11.3 million from the National Institutes of Health (NIH) to establish the Oklahoma Center for Respiratory and Infectious Diseases. Firstly, congratulations! Could you discuss the significance of this award for you?

This award is aimed at helping us to build infrastructure in the State. Respiratory disease has been a focus area here for several decades; first, largely dealing with respiratory disease in cattle, a major economic driver in the State. There has been a lot of excellent work done here by individuals, beginning in the 1960s with Drs Roger Panciera, Richard Corstvet and Harold Rinker. Later, there was work on vaccines against the main pathogens thought to be responsible for the disease. More recently, Drs Anthony Confer and Robert Fulton have performed exciting research on the pathogenesis of the disease and the host-pathogen interactions; the ultimate goal is to develop protective vaccines. Drs Douglas Step and Jared Taylor have been working to characterise the pathogens implicated in the disease to understand what changes may be occurring in the sick versus healthy animals.

As the recipient of the first Center of Biomedical Research Excellence (COBRE) grant in Oklahoma State’s history, what does this award mean both for CVHS, and in a broader context, for Oklahoma?

Oklahoma as a state has been pretty successful over the years in competing for these awards. There are many benefits to show for this effort. Strategically, it is to our advantage to collaborate and help one another across the institutions. This award gives us the opportunity to showcase our contributions to the larger biomedical sciences effort in the State. I believe our biomedical science community here considers the veterinary college an important asset and resource, and we now have a stage to show what we can do, providing leadership and building teams.

Who are the grant’s main investigators?

The Principal Investigator is Dr Lin Liu. He has brought together a team of senior investigators...
to mentor the younger scientists. We currently have four specific research projects that are central to the grant, each led by one of these younger scientists. There is additional funding for smaller competitive grants for which people across the State may apply. The goal is for these younger scientists, through the funding and mentoring, to establish themselves as independent investigators.

According to a World Health Organization (WHO) report, in 2004 respiratory infection had a greater global burden of disease than any other condition. Has the situation since improved? What role has CVHS played?

This remains true, and makes respiratory disease such a critically important area for research. Whether in people or animals, the respiratory tract is very vulnerable to external insult. We can reduce the damage we do to ourselves by reducing smoking, promoting clean air, safe workplace practices, and so forth. Humans, animals and animal products now move rapidly around the world, and pathogens are adapting, finding new niches and jumping across species into new hosts, often through the respiratory tract. Co-mingling, whether it’s cattle or people, often results in increased incidence of respiratory disease. I think comparative approaches to understanding these diseases have considerable value.

Can you briefly describe what your roles at the veterinary Center entail? Are your duties set to change following the establishment of the Oklahoma Center for Veterinary Health Sciences (CVHS)?

I serve as Associate Dean for Research and Graduate Education in the Center for Veterinary Health Sciences at Oklahoma State University, where I have been on the faculty since 1994; I am a Professor in the Department of Physiological Sciences and Adjunct Professor in the Department of Biochemistry and Molecular Biology. In addition to promoting our faculty and programmes, I have responsibility for research development in CVHS, including strategic planning, project management, and partnerships. I interact with university administration on regulatory compliance, grants and contracts management, intellectual property management, and university-industry relations. The grant will not affect my duties, but Dr Liu will have greater administrative responsibility than before.

NIH recognises the excellence of the research into infectious diseases being conducted in Oklahoma. To what can CVHS’s award be attributed specifically?

The excellent science is certainly an important part of this, but equally important is the quality of the interactions across the institutions, the mentoring environment that has been created, and the network and partnerships we have formed.

The Center for Veterinary Health Sciences at Oklahoma State University is home to a number of research teams working on a variety of pressing health issues. Following a Centers of Biomedical Research Excellence grant, the remit of their work is set to expand.

Research Excellence grant, the remit of their work is set to expand
INTELLIGENCE
OKLAHOMA CENTER FOR RESPIRATORY AND INFECTIOUS DISEASES

OBJECTIVES
Comparative research on diseases of the respiratory tract, whether caused by environmental stressors or pathogens; including pathogenesis, therapeutics, molecular mechanisms and bioengineering.

KEY COLLABORATORS
Center for Veterinary Health Sciences (CVHS), Oklahoma, USA:
Professor Lin Liu
Dr Antonius Oomens
Dr Heather Fahlenkamp
Professor Douglas Step
Dr Jared Taylor
Professor Robert W Fulton
Professor Anthony W Confer
Professor Michael Davis

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A WEALTH OF EXPERTISE
Although this work is in many ways the fundament of the CVHS’ research, a diversity of projects are in progress, and the grant for the new OCRID is a result of the overall impact of the research programme on Oklahoma. Dr Tom Oomens, for example, has been focusing on the treatment of RSV, building up information about the disease in the hopes of eventually producing a vaccine. Dr Lin Liu’s team, which focuses on chronic obstructive pulmonary disease, among other aspects, was responsible for securing the grant; the group has been investigating the disease for some time, and has recently conducted experiments on rodent models to investigate the possibility of combating the affliction with adult stem cells.

FUNDING THE FUTURE
The new grant includes four primary projects. The first of these is led by Oomens, and focuses on continuing his work with RSV – which could contribute to the development of a safe and effective vaccine for the disease. He has developed a novel system to study the role of the RSV M protein in virion assembly and production. Another project will rely on the tissue engineering expertise of Dr Heather Gappa-Fahlenkamp, in OSU’s School of Chemical Engineering. The objective of this endeavor is to develop a tissue-equivalent respiratory model for infectious diseases research.

SECONDARY OBJECTIVES
A fundamental goal of the grant from the CVHS’ point of view is the development of additional scientific expertise in the state; as such, an integral part of the work will be to develop a mentoring programme to guide junior investigators. The goal is to have the young scientists develop independently-funded programmes after two or three years; making room for more recruits; within five years, the Center hopes to have graduated between five and eight new researchers. Both external and internal advisory committees will provide additional advice to the younger faculty members, as well as monitoring their progress.

A second important objective of the grant project is to expand the research infrastructure to support these new researchers and the new center; this will be done through the establishment of scientific research cores. Further, it is hoped that the new center will be a hub for increased collaborative efforts within the state – and the grant recipients will take measures to ensure that this happens. After five years, there is a possibility that the grant could be renewed for another five-year period if it has proved successful; this will allow the already ambitious programme to continue to expand for the next decade. This would be a development hugely beneficial to the human residents of Oklahoma – as well as its animals.